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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,037	02/27/2004	Cenk Acar	UC1.PAU.48	8350

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EXAMINER

CHAPMAN JR, JOHN E

ART UNIT	PAPER NUMBER
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2856

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06/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/789,037	Applicant(s) ACAR ET AL. <i>W</i>	
	Examiner John E. Chapman	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "24" has been used to designate both a substrate (Figs. 1 and 4) and a spring (Fig. 2). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is not clear what it means for the drive-mode oscillator and the sense-mode oscillator to be "mechanically decoupled." Since the three masses are interconnected, they would appear to be mechanically coupled. Furthermore, since there are only three masses recited and both the drive-mode oscillator and the sense-mode oscillator

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comprise at least two masses, one mass must necessarily be part of both the drive-mode oscillator and the sense-mode oscillator. It is not clear how the common mass can be “mechanically decoupled” from itself.

Claim 2 is vague and indefinite. It is not clear how one can determine, from the apparatus itself, whether design parameters had been chosen in order to “dynamically amplify a movement of at least one of the three interconnected masses.” Whether a movement is “amplified” is a relative term and it is not clear with respect to what the movement is “amplified.” Furthermore, whether “amplified oscillation amplitudes without resonance” are achieved would depend upon the driving frequency of the drive-mode oscillator, in other words, on the method of operating the micromachined gyroscope. Hence, it is not clear whether claim 2 is directed to an apparatus or a method of operating the apparatus. Finally, according to the applicant, if the driving frequency is matched with the resonant frequency of the passive mass 40, then maximum dynamic amplification is achieved (page 37, lines 3-6, of the specification). However, such a situation corresponds to canceling out the input force applied to the active mass, i.e., zero amplitude of the active mass 38. It is not clear how “maximum dynamic amplification” is achieved when the maximum reduction of vibration occurs. In other words, it is not clear what applicant means by “dynamical amplification.” Finally, it is not clear that amplified oscillation amplitudes are achieved “without resonance,” since “maximum dynamic amplification” is achieved when the system is resonant, namely, when the driving frequency is matched with the resonant frequency of the passive mass 40. Hence, it would appear that amplified oscillation amplitudes are achieved with resonance, rather than without resonance.

Regarding claim 3, it is not clear what it means for the drive-mode oscillator and the sense-mode oscillator to be “mechanically decoupled in the drive direction from the sense direction.”

Regarding claim 4, it is not clear what it means for the drive-mode oscillator to comprise “three interconnected masses that collectively act as a passive mass.” Note that the mass 16 is described in the specification as an “active mass,” while masses 18 and 20 are described as a “passive mass.” See, for example, page 27, lines 3-6.

Regarding claim 10, it is not clear how a vibration amplifier both absorbs and amplifies the oscillations of the first mass.

Regarding claim 15, it is not clear how to perform the step of “decoupling the first motion from the second motion.” Since all three masses 16, 18 and 20 in Fig. 2 are driven in the x-direction in Fig. 2, all three masses 16, 18 and 20 would appear to comprise the “drive-mode oscillator.” While the mass 16 is restrained from motion in the sense (y) direction, the masses 18 and 20 are subject to motion in the sense direction in response to Coriolis forces derived from the motion of the masses 18 and 20 in the drive (x) direction. Hence, the motion of the masses 18 and 20 in the drive (x) direction does not appear to be “decoupled” from the motion of the masses 18 and 20 in the sense (y) direction.

Regarding claim 21, it is not clear what is meant by “coupling the third mass to the second mass by coupling the third mass using the second flexure.” The third mass is coupled to the second mass using the third flexure and not the second flexure. See claim 20, lines 11-12.

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4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 15, 17 and 20, as best understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Willig et al. (6,691,571).

Regarding claim 1, Willig et al. discloses a micromachined gyroscope comprising a drive mode oscillator formed by interconnected masses 100 and 102, and a sense mode oscillator comprising interconnected masses 100 and 140. The limitation that “the drive-mode oscillator and the sense mode oscillator are mechanically decoupled” is not given any weight in view of the lack of clarity of the limitation. Furthermore, the drive-mode oscillator (100 and 102) and the sense mode oscillator (100 and 140) are “mechanically decoupled” in the sense that the drive mass 102 is restrained from motion in the Y direction in response to Coriolis forces derived from the motion of the mass 100 in the X direction, in the same manner that the mass 16 of applicant is restrained from motion in the sense (y) direction in response to Coriolis forces derived from the motion of the masses 18 and 20 in the drive (x) direction.

Regarding claim 15, the motion of the drive-mode oscillator (100 and 102) is decoupled from the motion of the sense mode oscillator (100 and 140) in the sense that the drive mass 102 is restrained from motion in the Y direction in response to Coriolis forces derived from the motion of the mass 100 in the X direction, in the same manner that the mass 16 of applicant is

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restrained from motion in the sense (y) direction in response to Coriolis forces derived from the motion of the masses 18 and 20 in the drive (x) direction.

6. Applicant's arguments filed April 4, 2007 have been fully considered but they are not persuasive.

Regarding the rejection of claims 1 and 15 under 35 USC 112, 2nd paragraph, applicant argues that applicant is entitled to be his own lexicographer and the expression "mechanically decoupled" has been clearly defined in, for example, paragraph [0007] of the published application:

In the illustrated embodiment of the invention, we propose a (4 DOF) micromachined gyroscope system utilizing dynamical amplification to achieve large oscillation amplitudes without resonance, while mechanically **decoupling the drive direction oscillations from the sense direction oscillations**. [emphasis added by applicant, 4 DOF omitted by applicant].

The recited passage, however, does not provide a definition of the expression "mechanically decoupled." Rather, it simply uses the expression "mechanically decoupling" in the description of the micromachined gyroscope. Consequently, the claim terms must be presumed to be given their ordinary and customary meaning. The ordinary and customary meaning of "decoupled" is disconnected, so that the ordinary and customary meaning of "mechanically decouple" would mean not connected by mechanical components. Consequently, it is not clear what it means for the drive-mode oscillator and the sense-mode oscillator to be "mechanically decoupled," since the three masses that comprise the drive-mode oscillator and the sense-mode oscillator are clearly "mechanically coupled," i.e., connected by mechanical components, namely, folded flexures 28a, 28b, 28c and 28d.

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Applicant argues that “successful decoupling is clearly described by, for example, the equation of motion in the drive direction (*i.e.*, the equation following paragraph [0087] of the published application), *and* the equation of motion of the sense-mode oscillator.” However, it is not clear that the equations of motion clearly describe successful decoupling. It is not clear that there is a “lack of coupling terms in the equation of motion.” Furthermore, it is not clear that, if by “mechanically decoupled” applicant means a lack of coupling terms in the corresponding equation of motion, that a clear structural limitation is imposed on the claimed apparatus. It is noted that a number of assumptions are incorporated into the equations of motion, for example, that the active mass 18 is significantly larger than the passive mass 20 (see paragraph [0095]), which assumptions lack proper antecedent basis in the claims.

Applicant argues that the expressions “resonant” and “nonresonant” have been clearly defined in the specification. Applicant fails to explicitly point out where such definitions appear in the specification.

Applicant argues that the rejection under 35 USC 102(e) based on Willig et al. (6,691,571) should be withdrawn, since the Office action on page 10, lines 1-6, indicates that the prior art date of the reference is determined under 35 USC 102(e) prior to amendment by the AIPA. While applicant is correct in that Willig was filed after November 29, 2000, the Willig reference nevertheless qualifies as prior art under 35 USC 102(e), albeit subsequent to the amendment by the AIPA. Consequently, the rejection under 35 USC 102(e) based on the Willig patent (6,691,571) will not be withdrawn.

Applicant argues that “the drive mode oscillator and the sense mode oscillator of the claimed invention each contain *at least two masses*.” Such limitation fails to distinguish over

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Willig, since Willig discloses a micromachined gyroscope comprising a drive mode oscillator formed by interconnected masses 100 and 102, and a sense mode oscillator comprising interconnected masses 100 and 140.

Applicant argues that "Neither of the purported "decouplings" in Willig is, in fact, is equivalent to the decoupling between the drive-mode oscillator and the sense-mode oscillator of the claimed invention." As indicated above, it is highly unclear what applicant means by "decoupling between the drive-mode oscillator and the sense-mode oscillator." Consequently, it is not clear how such limitation distinguishes over the Willig patent.

Applicant argues that Willig fails to teach operation in a non-resonant mode. However, as indicated above, it is not clear that applicants device operates "without resonance," since "maximum dynamic amplification" is achieved when the system is resonant, namely, when the driving frequency is matched with the resonant frequency of the passive mass 40. Consequently, it is not clear that such a limitation serves to distinguish over the Willig patent.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

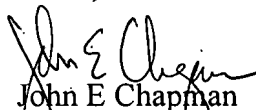
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John E. Chapman whose telephone number is (571) 272-2191. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


John E. Chapman
Primary Examiner
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